
Wnt6 plays a complex role in maintaining human limbal stem/progenitor cells.

Journal: Sci Rep

Publication Year: 2021

Authors: Clemence Bonnet, Denise Oh, Hua Mei, Sarah Robertson, Derek Chang, Jean-Louis Bourges, Francine Behar-Cohen, Jie J Zheng, Sophie X Deng

PubMed link: 34686698

Funding Grants: Regeneration of Functional Human Corneal Epithelial Progenitor Cells , Regeneration of a Normal Corneal Surface by Limbal Stem Cell Therapy, Safety and Feasibility of Cultivated Autologous Limbal Stem Cells for Limbal Stem Cell Deficiency

Public Summary:

The cornea is consistently regenerated by a population of stem cells. We have shown that Wnt6, a protein involved in one of the signaling pathways of these stem cells, could regulate the biology of these stem cells.

Scientific Abstract:

The corneal epithelium is consistently regenerated by limbal stem/progenitor cells (LSCs), a very small population of adult stem cells residing in the limbus. Several Wnt ligands, including Wnt6, are preferentially expressed in the limbus. To investigate the role of Wnt6 in regulating proliferation and maintenance of human LSCs in an in vitro LSC expansion setting, we generated NIH-3T3 feeder cells to overexpress different levels of Wnt6. Characterization of LSCs cultured on Wnt6 expressing 3T3 cells showed that high level of Wnt6 increased proliferation of LSCs. Medium and high levels of Wnt6 also increased the percentage of small cells (diameter ≤ 12 microm), a feature of the stem cell population. Additionally, the percentage of cells expressing the differentiation marker K12 was significantly reduced in the presence of medium and high Wnt6 levels. Although Wnt6 is mostly known as a canonical Wnt ligand, our data showed that canonical and non-canonical Wnt signaling pathways were activated in the Wnt6-supplemented LSC cultures, a finding suggesting that interrelationships between both pathways are required for LSC regulation.

Source URL: <https://www.cirm.ca.gov/about-cirm/publications/wnt6-plays-complex-role-maintaining-human-limbal-stemprogenitor-cells>